

Spot Safety Project Evaluation

Project Log # 200505118

Spot Safety Project # 01-00-227

Spot Safety Project Evaluation of the Installation of Guardrail around Existing Overhead Sign Supports on US 158 in Dare Co.

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

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Traffic Safety Project Engineer

02-24-2006
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 01-00-227 - The installation of guardrail around existing overhead sign supports on US 158 in Dare Co.

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis of the treatment data has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was to install guardrail around the overhead sign structure supports located on US 158 200' west of Grayeagle Street. US 158 is a five-lane, 50-mph facility with a center left turn lane. The initial crash analysis for this intersection was completed from January 1, 1997 to January 4, 2000. There were a total of 2 crashes including 1 run off road crashes which resulted in a Fatal crash. The stated reason for this improvement was to provide safer movement for the motoring public. The final completion date for the guardrail installation along the subject road was on July 30, 2001 at a cost of \$20,000.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from June 2001 through August 2001. The before period consisted of reported crashes from June 1, 1997 through May 31, 2001 (4 years) and the after period consisted of reported crashes from September 1, 2001 through August 31, 2005 (4 Years). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed. The analysis consisted of the treatment data along US 158 from MP 17.54 to MP 17.60 with a 0' y-line.

The following data table depicts the Naive Before and After Analysis for the above information. Please note that Ran Off Road Crashes were the target crashes for the applied countermeasure. These crash types considered are as follows: Ran Off Road-Left, Ran Off Road-Right, Ran Off Road-Straight, Overturn/Rollover, Fixed Object, Head-On; Sideswipe, Same Direction; Sideswipe, Opposite Direction.

<u>Treatment Information</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total crashes	1	2	100.0
Total Severity Index	76.8	4.7	-93.9
Target Crashes	1	1	0.0
Target Severity Index	76.8	1.0	-98.7
Volume	18000	24000	33.3
<u>Treatment Injury Information</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	1	0	-100.0
Class A	0	0	0.0
Class B	0	0	0.0
Class C	0	1	100.0
Property Damage Only	0	1	100.0
<u>Target Injury Information</u>			
	Before	After	Percent Reduction (-) Percent Increase (+)
Fatal	1	0	-100.0
Class A	0	0	0.0
Class B	0	0	0.0
Class C	0	0	0.0
Property Damage Only	0	1	100.0

Table 1.

The naive before and after analysis at the treatment location resulted in a 100 percent increase in Total Crashes, a 0.0 percent change in Target Crashes, and a 33.3 percent increase in Average Daily Traffic (ADT). The Treatment Injury Information resulted in a 100.0 percent decrease in FataIs, a 100.0 percent increase for Class C, and a 100.0 percent increase for Property Damage Only. The Target Injury Information resulted in a 100.0 percent decrease in FataIs and a 100.0 percent increase for Property Damage Only. The before period ADT year was 1999 and the after period ADT year was 2003.

Results and Discussion

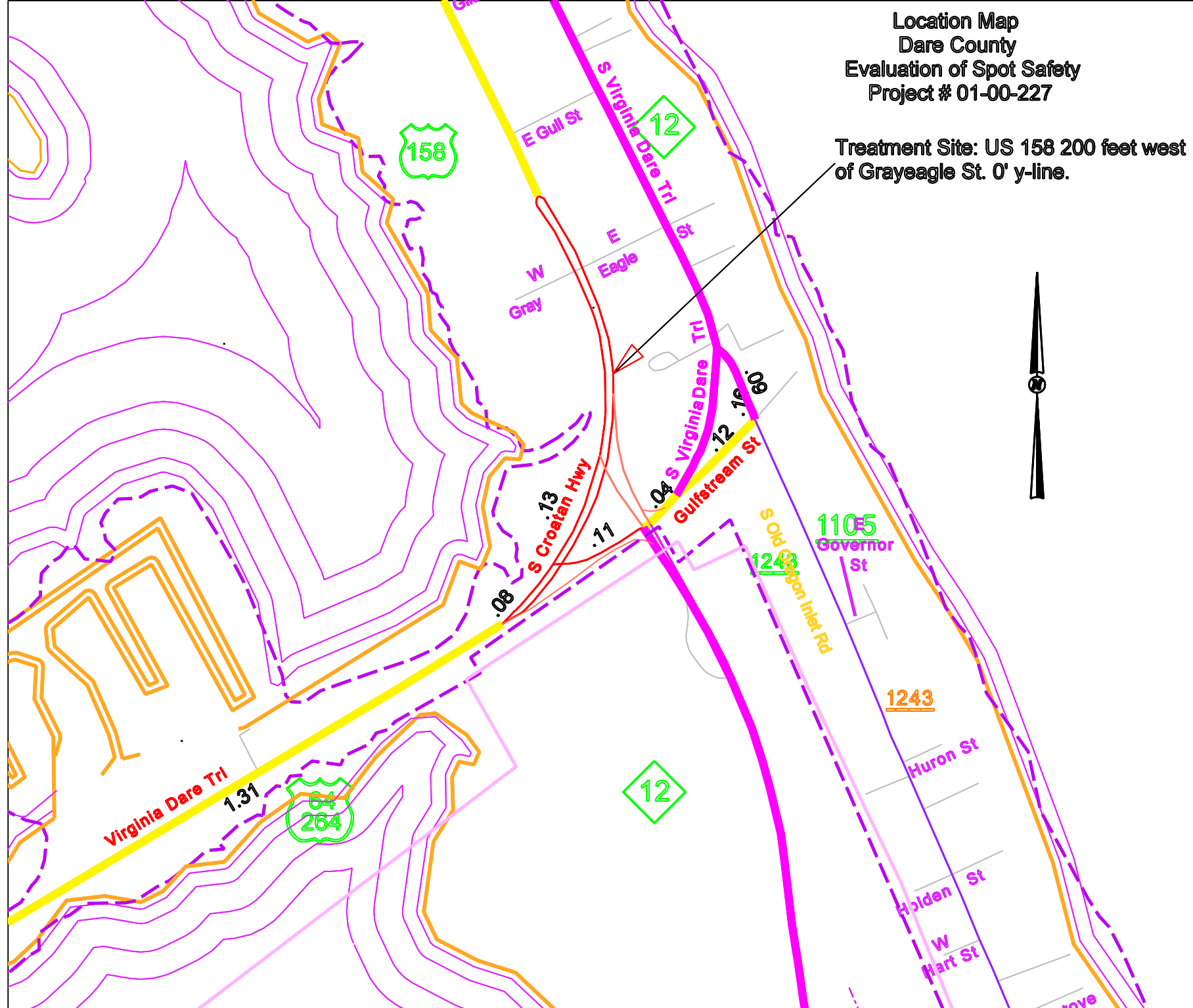
The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 100 percent increase in Total Crashes and a 0.0 percent change in Target Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in the number of Total Crashes and no change in the number of Target Crashes from the before to the after period.

Since the countermeasure was installed, no further collisions involving the overhead sign supports have occurred. In the unfortunate event of a crash the guardrail should perform its intended function of protecting the vehicle from a high severity crash. Also, referencing the photos, reflectors were installed along the face of the guardrail, this may help delineate the roadway at night alerting the drivers to the edge of the roadway and the overhead sign supports.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of road.

Location Map
Dare County
Evaluation of Spot Safety
Project # 01-00-227

Treatment Site: US 158 200 feet west
of Grayeagle St. 0' y-line.



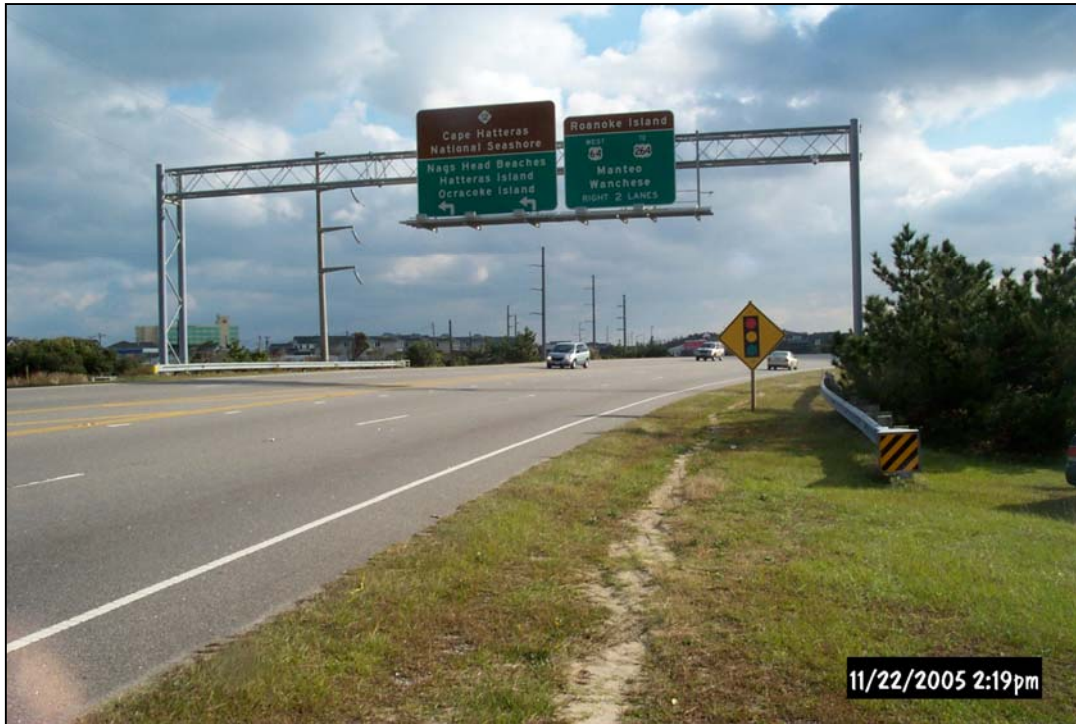
Treatment Site Photos Taken on November 22, 2005



Facing east



Facing east



Facing east



Looking at westbound support



Looking at westbound support



US 158 US 64

LEGEND

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		P PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		B BICYCLE
	PARKABLE VEHICLE		BACKING		20 MPH TO 29		T TRAIN
	PARKABLE VEHICLE		SIDE-SWIPE		30 MPH TO 39		A ANIMAL
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		o DRIVER AT FAULT
	HEAD ON		SPEED UNKNOWN		50 MPH TO 59		D DOW
	REAR END		HIT		60 MPH TO 69		W WET
	RAN OFF ROAD		FATALITY		70 MPH OR UP		I ICE ON ROAD

Overhead sign supports

Dare County
Treatment Site - Total Crashes
Before Period
June 1, 1997 - May 31, 2001
(4 years)

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT		COLLISION DIAGRAM	
HIGHWAY SAFETY IMPROVEMENT PROGRAM		SAFETY INFORMATION MANAGEMENT AND SUPPORT	
		DIVISION:	AREA:
		STUDY PERIOD: 6/1/1997 TO 5/31/2001	
		DISTANCE: T-MILES: 100 FT	
		ANALYSIS PREPARED BY: S. CORRENO	
		DIAGRAM PREPARED BY: S. CORRENO	
SAFETY EVALUATION		TRAFFIC SAFETY	
BEFORE GUARDRAIL INSTALLATION		SCALE: NOT TO SCALE	
DATE: JANUARY 2006		LOG NUMBER:	
N.C. DEPARTMENT of TRANSPORTATION DIVISION of HIGHWAYS TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH			

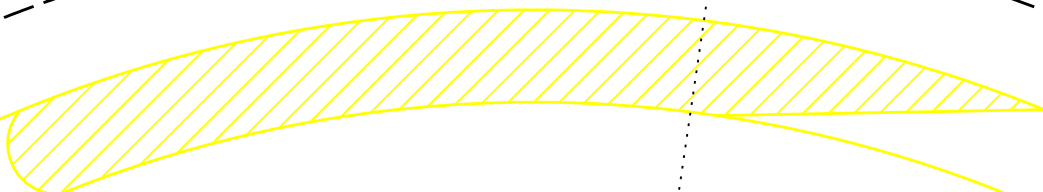


LEGEND

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		P PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		B BICYCLE
	PAKED VEHICLE		BACKING		20 MPH TO 29		T TRAIN
	PAKED VEHICLE		BACKING		30 MPH TO 39		A ANIMAL
	FIXED OBJECT		SKIDMARK		40 MPH TO 49		• DRIVER AT FAULT
	HEAD ON		OUT OF CONTROL		50 MPH TO 59		D DIRT
	REAR END		HALT		60 MPH TO 69		W WET
	RUN OFF ROAD		FATALITY		70 AND UP		DATA OUT CRASH
			HALT		SPEED WARNING		DATA CRASH
			FATALITY		DATA CRASH		I ICE OR SNOW

US 158

US 64



2

W

1

W

Overhead sign supports

Installed Guardrail

Dare County
Treatment Site - TotalCrashes
After Period
September 1, 2001 - August 31, 2005
(4 years)

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT		COLLISION DIAGRAM	
HIGHWAY SAFETY IMPROVEMENT PROGRAM		SAFETY INFORMATION	
		DIVISION: ..	AREA: ..
		STUDY PERIOD: 9/1/2001 TO 8/31/2005	
		DISTANCE: ..	Y-LINE: 80 FT
		ANALYSIS PREPARED BY: S. COVINO	
		DIAGRAM PREPARED BY: S. COVINO	
		DIAGRAM REVIEWED BY: ..	
SAFETY EVALUATION		TRAFFIC SAFETY	
METER GUARDRAIL INSTALLATION		SCALE: ..	NOT TO SCALE
		DATE: ..	JANUARY 2006
		LOG NUMBER: ..	
N.C. DEPARTMENT of TRANSPORTATION			
DIVISION of HIGHWAYS			
TRAFFIC ENGINEERING AND SAFETY			
SYSTEMS BRANCH			